Articles of Food Used. Lean veal, lean ham, whites of eggs, oysters, gelatin, lima beans, lentils, split peas, green peas, mushrooms, rice, oatmeal, bananas, skimmed milk, coffee, tea and cocoa.

The fluid allowed is restricted to the quantity present in the food, plus that which is necessary for the comfort of the individual patient, amounting usually to 1200 to 1500 cc. The amount of salt allowed is the quantity sufficient to make the food palatable.

I might state at this point that the use of pure proteins in the feeding of cases of chronic nephrosis is at present under investigation.

Disappearance of the edema and even marked diminution of the albuminuria does not mean a complete cure of the nephrosis. A complete cure is established when, besides the disappearance of symptoms, there is also a normal state of the blood as regards the cholesterol, protein and the albumin-globulin ratio.

In conformity with the view that chronic nephrosis is a metabolic disease related to a state of hypothyroidism, I have used thyroid gland therapy in a number of cases which were more obstinate, and I had gratifying results. The relationship of the thyroid gland to obscure cases of edema has been made the subject of a study by Eppinger.[65] In his work he presents most remarkable data of increased diuresis following administration of the thyroid gland in various forms of edema. No basal metabolism studies, however, are given. Volhard[66] has also seen good results from thyroid gland administration.

The effect of thyroid feeding upon some cases of nephrosis is so striking that there can be but little doubt as to the relation of thyroid deficiency to this disease. The frequent occurrence of nephrosis in children and the usual gravity of the condition in such cases suggest the possibility of its being due to a deficiency of some factor in the food—possibly a vitamine.

In this connection the experience of writers on war nephritis is of interest who found a peculiar tendency in the kidneys to fatty degenerative changes, and who ascribe these changes to disorders of nutrition (Munk).[67] This possibility should be borne in mind in future studies of the subject.

THE PREVALENCE OF FREE HYDROCHLORIC ACID IN CASES OF CARCINOMA OF THE STOMACH.

By Howard R. Hartman, M.D.,

SECTION ON MEDICINE, MAYO CLINIC, ROCHESTER, MINN.

Achlorhydria is so frequently associated with carcinoma of the stomach that one acquires the habit of looking for it as a diagnostic sign of carcinoma. This habit grows until one hesitates to make a diagnosis of carcinoma of the stomach in the presence of any appreciable amount of free hydrochloric acid in the gastric secretions. Clinicians who have the opportunity to observe the results of fractional analysis of the gastric contents find that achlorhydria is not essential to the diagnosis of gastric carcinoma. As a means of corroborating this finding a statistical review was undertaken of the analysis of gastric contents in cases in which operation was performed for cancer at the Mayo Clinic during the years 1918, 1919, and 1920. Since the results for each year were quite uniform the data were studied as a whole. When the surgeon noted the location of the lesion in the pyloric, middle, or cardiac portion of the stomach this was considered in classifying the data.

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[65] Zur Pathologie und Therapie des menschlichen Odems, Berlin, 1917.

[66] Loc. cit.

[67] Loc. cit.

During the three years, there were 551 patients with gastric carcinoma and 80 patients with carcinomatous ulcer operated on. Of the latter, with one exception, a case of gall-stone, gastric lesions were clinically suspected. Forty-five per cent of the cases were diagnosed ulcer, 41.25 per cent cancer, and in 12.15 per cent the diagnosis was suspected gastric malignancy.

The gastric acidity was first classified separately according to the location of the lesion and then together. Of the 551 patients with carcinoma, 47 did not have test meals because they were too weak to stand them, because the stomach was found empty on aspiration, because of a mistaken diagnosis, because the patient's condition demanded an emergency operation and so forth. In 122 patients the lesions were not located by the surgeon, although resection was performed. In 66 patients the condition was found inoperable. An exploration or a gastro-enterostomy only was made for the relief of an obstruction. In 297 patients the lesions were in the pyloric end of the stomach, in 27 in the middle portion, and in 39 in the cardiac end. These data were taken from patients who were operated on; this accounts for the preponderance of pyloric lesions which are favorable for surgical measures, whereas lesions higher up are not accepted by the surgeon (Table I).

TABLE I.—CARCINOMA.

	Cases.	Per cent.	Achylorhydria.	Per cent.	Hypoacidity.	Per cent.	Normal.	Per cent.	Hyperacidity.	Per cent.	No test meal.	Per cent.
Not located	122	22.14	67	54.9	12	9.83	22	18.+	4	3.27	17	13.9
Inoperable	66	11.97	40	60.6	8	12.12	11	16.66	4	6.06	3	4.54
Pyloric .	297	53.9	154	51.85	53	17.84	54	18.18	15	5.05	21	7.07
Middle .	27	4.9	11	40.74	11	40.74	5	18.51	0	....	0	
Cardia .	39	7.07	24	61.54	3	7.69	4	10.25	2	5.12	6	15.38
Ignoring location.	551	.....	296	53.72	87	15.78	96	17.42	25	4.53	47	8.53

The normal amount of free hydrochloric acid was estimated at from 20 to 40. The classification of the lesions according to location revealed little of importance. However, in 51.85 per cent of the pyloric lesions achlorhydria was present and the pyloric end of the stomach is not supposed to possess any acid-forming cells that could be destroyed by a new growth. In 5.05 per cent of the pyloric lesions the values were hyperacid. In the cardiac portion, the location of the acid-forming cells, the achlorhydria was 61.54 per cent and the hyperacid values 5.12 per cent.

The location of the lesion apparently does not materially influence the degree of the acidity. It is impossible from these statistics to determine the percentage of occurrence of any one degree of acidity in any one division of the stomach. Pyloric lesions predominate in patients operated on and therefore they have the highest percentage occurrence in any one degree of acidity.

Attention is called to the total findings in Table I, in which the gastric analyses have been studied without reference to the location of the lesion. Only 53.72 per cent., about one-half of the patients, had achlorhydria; 15.78 per cent had free hydrochloric acid in small amounts. In 17.42 per cent the gastric acidity was normal and 4.58 had hyperacid values. The sum of the last two figures show that 21.95 per cent, or more than 1 case out of 5, had normal or hyperacid values. Thirty-seven and seventy-eight hundredths per cent, or about 2 out of 5 cases, had a certain amount of free hydrochloric acid. The occasional marked difference between free and total acidity is shown in Table II; this occurs particularly in pyloric lesions. It cannot be explained by obstruction with retention of the neutralizing food, because in the cases in which the difference in the acidity was more than 40 there was obstruction only in 34.28 per cent.

In Table III are data concerning gastric ulcer undergoing malignant change. Only 22.5 per cent of cases had hypoacid values. The sum of the percentages of those having some acid (hypoacidity, normal acidity and hyperacidity) is 72.5. The extent of the malignancy therefore seems to influence the amount of free acid because the same total in carcinoma cases was only 37.78 per cent. In Table IV it may be seen that out of 631 cases of gastric carcinoma in all stages of development 49.76 per cent showed achlorhydria; 15.2 per cent hypoacidity, 19.96 per cent normal acidity and 6.97 per cent hyperacidity. The sum of the last two figures shows that 26.93 per cent, or about 1 case out of 4, had normal or hyperacid values. Forty-two and fourteen hundredths per cent had some free hydrochloric acid present. One should expect then to find free hydrochloric acid in about every other case.

It is seen, therefore, that achlorhydria is present in a little less than one-half of the cases of carcinoma of the stomach. Normal or hyperacid values can be expected in more than one-fourth. The

TABLE II.

Achlorhydria.				Hypoacidity.				Normal.				Hyperacidity.				No test meal.				Not located.				
Pyloric.	Middle.	Cardiac.	Inoperable.	Pyloric	Middle.	Cardiac.	Inoperabl.	Pyloric.	Middle.	Cardiac.	Inoperable.	Pyloric.	Middle.	Cardiac.	Inoperable.	Pyloric.	Middle.	Cardiac.	Inoperable.	Achlorhydria.	Hypoacidity.	Normal.	Hyperacidity.	No test meal.
24-0	20-0	8-0	16-0	32-15	28-16	28-16	32-16	46-26	40-20	42-30	46-26	76-56		60-42	76-60	323060		338252		20-0	26-10	40-28	60-40	301646
12-0	20-0	10-0	8-0	30-18	24-6		24-14	42-32	44-20	34-22	54-36	66-44			80-56					8-0	28-16	40-24		332781
8-0	0-0	10-0	12-0	20-10	26-16		24-14	34-24	40-20		44-30	90-62			94-50	337719				10-10		40-20		304330
12-0	20-0	12-0	10-0	20-6	30-16		30-10	54-34			30-20	64-44			66-40	326764				12-6		50-24		302254
14-0	10-0	10-0	12-0	16-6			28-10	40-20			40-26	56 44								20-0				332312
12-0	14-0	10-0	10-0	36-16				48-28			42-20	60-40								12-0				338405
10-0		12-0	16-0	38-16				50-30				76-40								12-0				
12-0		10-0	12-0	34-10				58-38				78-44								14-0				
14-0			10-0	40-18				38-22				60-44												
10-0			26-0	32-16				38-20				64-44												
20-0			20-0	36-16				50-24				62-40												
20-0			12-0	38-18				48-28																
20-0			20-0	52-8				44-24																
12-0			16-0	22-8				54-34																
10-0			20-0	40-10				64-38																
16-0			50-0	38-18				78-32																
14-0			10-0	28-12				56-38																
30-0			10-0	28-8				46-24																
12-0			10-0	28-12				56-38																
30-0				75-12				60-34																
32-0				26-12				66-30																
48-0				34-14				44-24																
8-0				30-14				44-24																
12-0				12-2				70-34																
20-0				24-18				56-34																
20-0				58-18				40-28																
50-0				58-18																				
18-0				60-16																				
10-0				36-16																				
12-0				30-16																				
10-0				84-14																				
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14-0																								
40-0																								
34-0																								
20-0																								
18-0																								
30-0																								
20-0																								

Acidity is expressed in the number of cubic centimeters of decinormal sodium hydroxide necessary to neutralize 100 cc of gastric juices.

FREE HYDROCHLORID ACID.

Achlorhydria	0	Normal acidity	20-40
Hypoacidity	0-20	Hyperacidity	40-+

TABLE III.—CARCINOMATOUS ULCERS.

	Cases.	Per cent.	Achlorhydria.	Per cent.	Hypoacidity.	Per cent.	Normal.	Per cent.	Hyperacidity.	Per cent.	No test meal.	Per cent.
Not located	22	27.50	6	27.27	3	13.63	5	22.72	7	31.36	1	4.54
Inoperable	..	.....	..	.....	..	.....	..	.....	..	.....	..	
Pyloric .	50	62.5	10	20.00	..	12.00	22	44.00	12	24.00	..	
Middle .	3	3.75	1	33.33	..	.....	2	66.66	..	.....	..	
Cardia .	5	6.25	1	20.00	..	.....	1	20.00	..	.....	3	60.00
Ignoring location	80	.....	18	22.50	9	11.25	30	37.5	19	23.75	4	5.00

TABLE IV.—CARCINOMA AND CARCINOMATOUS ULCERS.

	Cases.	Per cent.	Achlorhydria.	Per cent.	Hypoacidity.	Per cent.	Normal.	Per cent.	Hyperacidity.	Per cent.	No test meal.	Per cent.
Not located	144	22.82	73	50.69	15	10.41	27	18.75	11	7.63	18	12.5
Inoperable	66	10.45	40	60.6	8	12.12	11	16.66	4	6.06	3	4.54
Pyloric .	347	54.99	104	47.26	59	17.0	76	21.9	27	7.78	21	6.05
Middle .	30	4.75	12	40.0	11	36.66	7	23.33	..	.....	..	
Cardia .	44	6.97	25	56.81	3	6.81	5	11.36	2	4.5	9	20.45
Ignoring location.	631	.....	314	49.76	96	15.21	126	19.96	44	6.97	51	8.08

acid values represent the highest reading obtained by a fractional analysis of the gastric contents; this, I believe, gives a greater chance of obtaining higher and more accurate values than the single tubing.

THE RELATION OF ACROMEGALY TO THYROID DISEASE: WITH A STATISTICAL STUDY.*

BY J. M. ANDERS, M.D., LL.D.

AND

H. L. JAMESON, M.D.

PHILADELPHIA.

THE view that acromegaly is caused by hyperactivity of the anterior pituitary body after epiphyseal union has taken place is

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* Read before the Association of American Physicians at Atlantic City, May 11, 1921.